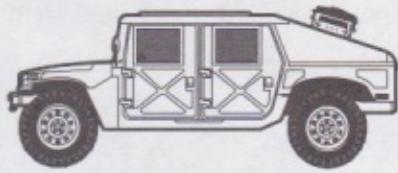


M1025  
M1026  
M1043  
M1044  
M1109  
M1114



# Air Conditioner for HMMWV with Add-On Armor

## RD-2-4114-0 & RD-2-4233-0 INSTALLATION INSTRUCTIONS

Install refrigerant compressor per instructions provided with compressor mount kit.

### TOOLS REQUIRED

#### SYSTEM INSTALLATION

- Uni-bit step drill up to  $\frac{3}{4}$ " diameter or  $\frac{1}{4}$  inch,  $1\frac{1}{16}$ " and  $\frac{3}{4}$ " drills/hole saws
- $1\frac{1}{4}$ " hole saw
- Power drill that will accept drill bits and hole saws listed above
- No. 2 phillips screwdriver bit for drill, 2 inch long
- No. 2 phillips screwdriver
- Ratchet
- Breaker bar
- 5 inch extension
- 10mm socket
- 13mm socket
- $\frac{3}{4}$ " socket
- 8mm nut driver or socket with nut driver handle
- De-burring tool or small rat tail file
- Pocket knife
- Scissors
- 16 oz. hammer
- Center punch
- $5/8$ " open end wrench
- $\frac{1}{4}$ " open end wrench
- $\frac{3}{4}$ " open end wrench
- $\frac{7}{8}$ " open end wrench
- $1\frac{1}{16}$ " open end wrench
- 10mm open end wrench
- 13mm open end wrench
- Hose fitting crimp pliers (supplied in A/C kit)
- Hose cutter or knife (supplied in A/C kit)
- Duct tape
- M10x1.5 tap with handle or brush
- Needle nose pliers
- Hack saw (2 door and ring turret only)
- Wire cutters

#### REFRIGERANT CHARGING EQUIPMENT

- Charging gauges and scale or charging station
- Vacuum pump
- R-134a refrigerant

**Before starting installation review parts list included in kit to verify that all required parts needed for installation were received.**

### PARTS NOT USED

This kit is designed to fit several but not all configuration of HMMWV. As such, not all parts will be used on all applications and some installations may require modifications to fit differing vehicle configurations. Some small, inexpensive but critical spare parts have been included in case of loss or damage during installation. The following is a list of parts that may not be required on some vehicles

#### Not used on two-door

- Upper evaporator support brackets
- M-8 nylon lock-nuts
- #6 straight female fitting
- 2.5" square ducting

#### Not used on four-door

- #6 45° female fitting

#### Not used for two-door, 1 only used on four-door

- B-pillar clamps

#### Not used on two-door or ring turret

- Duct saddle

#### Not used on two- or four-door

- 3" flex hose
- Four additional band clamps

#### Not used for 2 door, only 4 used for four-door

- M5x16mm screws

#### Spares included

- Hose fitting cages and clips

- O-Rings #6, #8 & #10

#### Not used on ANY M1025

- Angle brace - Drivers
- Angle brace - Passenger
- #6 straight female fitting
- $\frac{3}{8}$ " stainless steel tube

#### Not used on A-1

- #8 90° female fitting

#### Not used on A-2

- #8 45° female fitting

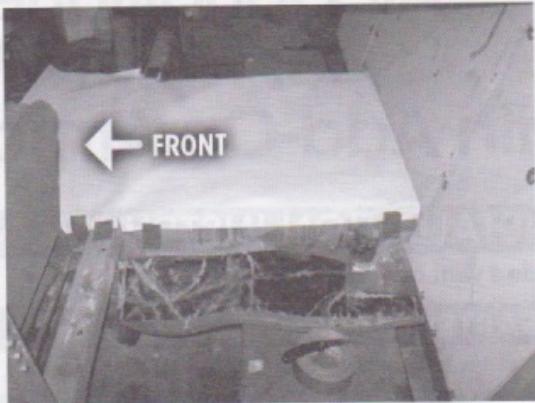
### CONCURRENT TASKS

Air conditioner current draw is approximately 20 amperes. At minimum, a 100 amper alternator is required for vehicles with air conditioner and communications equipment. Verify the alternator has a rating of 100 amperes or higher. If alternator will be upgraded to allow installation of A/C, some tasks can be performed simultaneously to avoid repeating tasks.

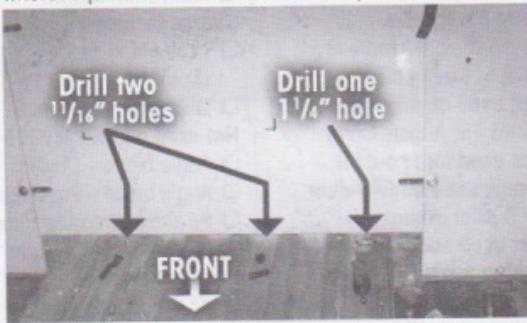
- Removal and replacement of belts for alternator and A/C compressor.
- Disconnect/re-connect battery.
- Route and attach power cable from alternator to battery compartment.
- Check power steering, waterpump and crankshaft pulleys for wear. Replace if needed. Uneven wear will prevent proper belt tensioning.



## EVAPORATOR AND CONDENSER MOUNTING



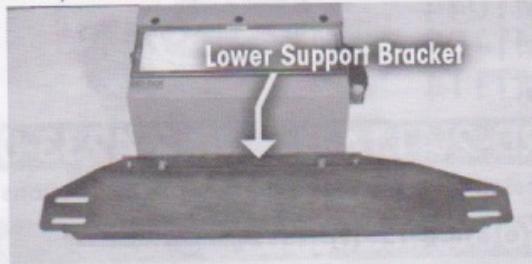
1. If present, remove plywood panel from between seats on top of transmission tunnel. Remove top screws attaching driver's side mats to side of transmission tunnel. Place drill template on transmission tunnel and tape into position. Before drilling, ensure nothing will be damaged by drill on underside of transmission tunnel. Drill two  $1\frac{1}{16}$ " (.6875 inch) diameter holes and one  $1\frac{1}{4}$ " (1.25 inch) diameter where required then de-burr far side of panel.



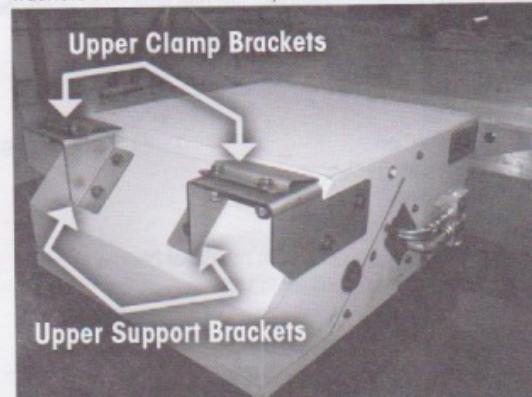
2. Remove front passenger seat to expose battery box. Drill  $\frac{3}{4}$ " diameter hole in rear battery box panel near top inboard edge. Install grommet.



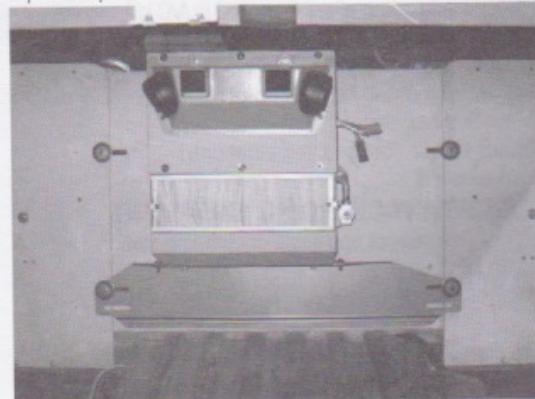
3. Attach lower support bracket to evaporator unit "L" brackets using two M8x1.25x25mm bolts, two flat-washers and two M-8 nylon lock-nuts.



4. Attach upper clamp brackets. Loosely attach the upper clamp brackets to the upper support brackets on the evaporator unit using four M8x1.25x25 bolts, four M8 flat-washers and four M8x1.25 nylon lock-nuts.

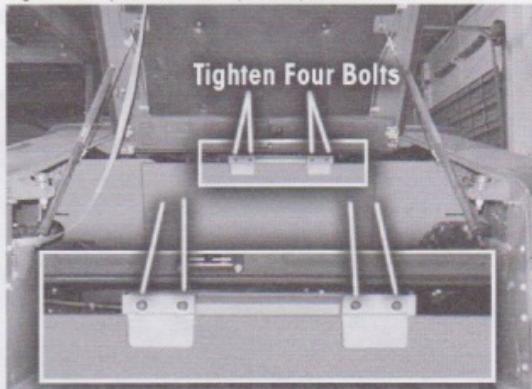


5. Remove two lower center  $\frac{1}{2}$ " bolts attaching rear center armor plate to rear side armor plates. Hang evaporator unit from inside top of armor plate (above holes drilled in transmission tunnel). Adjust side to side position to align slots in lower support bracket with slots in center armor plate. Close hatch and check for handle interference with top of evaporator unit.



REDFERNS  
P.O. Box 6700, Seattle, WA 98136  
(206) 767-6000 or (800) 574-6000

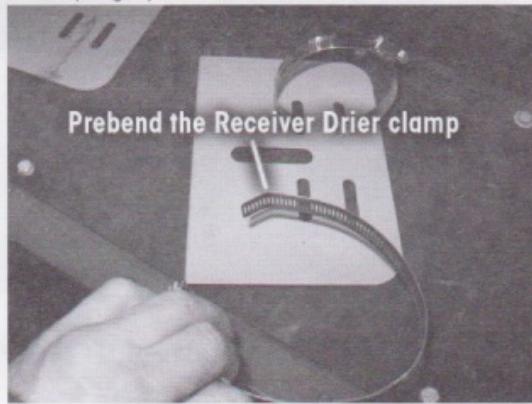
6. Tighten evaporator unit top clamp bracket bolts.



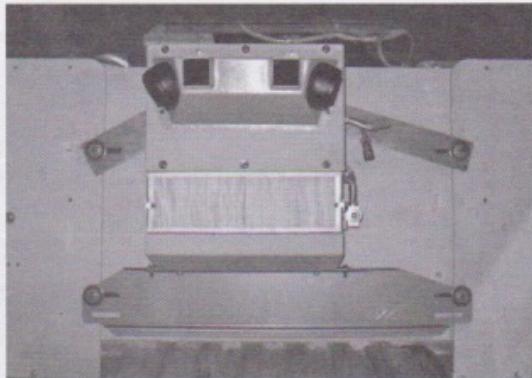
7. Insert new  $\frac{1}{2}$ -13x2  $\frac{1}{2}$ " bolts with flat washers and .2  $\frac{1}{2}$ " oversize washers through lower evaporator support bracket, and armor plates. Install flat-washers, and nylon lock-nuts.



8. Remove two top center  $\frac{1}{2}$ " bolts attaching rear center armor plate to rear side armor plates.  
9. Install band clamps on receiver drier bracket. Prebend end of clamp slightly to ease installation (see below).



10. Loosely attach evaporator side brackets to evaporator unit with original hardware. Install new  $\frac{1}{2}$ -13x2  $\frac{1}{2}$ " bolts with flat-washers and .2  $\frac{1}{2}$ " oversize washers through evaporator side brackets, armor plates and receiver drier bracket. Install flat washers and nylon lock-nuts.



- 11.** Drill 1.25 inch diameter hole for condenser hose.



- 12.** To prevent cargo from sliding forward in bed and damaging hose, place cargo stop in recessed channel of bed behind

the 1 1/4" hole drilled for the #8 hose grommet. Drill 1/4" diameter hole in bed using the cargo stop as drill guide. From underneath vehicle, insert M6x22mm washer head screw with 1 1/2" inch O.D. washer through hole in bed and attach guard with M6 nylon lock-nut.

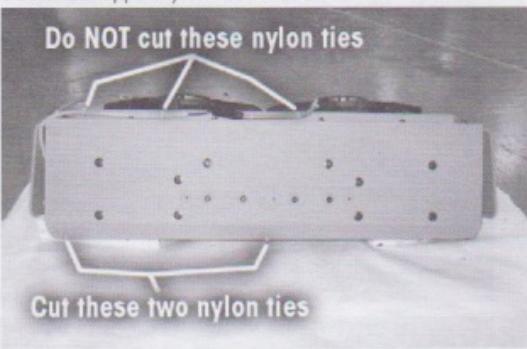


## M1025 CONDENSER RECONFIGURATION

Instructions for converting A/C condenser from canvas top mounting configuration (M998) to hard back configuration (M1025)

**NOTE:** use caution when handling condenser assembly, avoid damaging fins on underside of condenser. It is strongly recommended that the corrugated cardboard be left in place until installation is complete.

- Cut two nylon wire ties on lower edge of air deflector plate. Do not cut upper nylon ties if used.



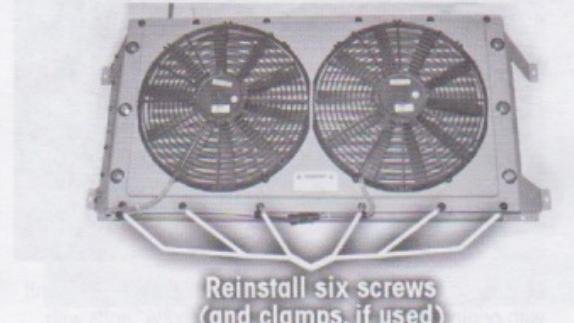
- Using a 10mm socket, remove 4 screws attaching electrical EMI filter panel to air deflector plate. Save hardware.



- Using a 10mm socket, remove 12 screws attaching air deflector plate to condenser assembly. Discard air deflector.



- Re-install 6 screws along top edge of condenser assembly. If condenser wire harness was secured with clamps, reattach wire harness clamps with original screws after removing deflector plate.



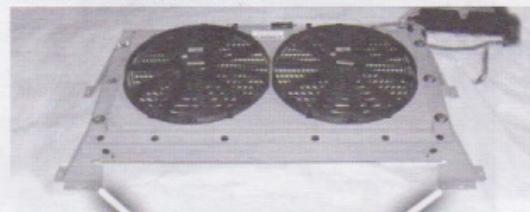
5. Using a 10mm socket, remove two screws attaching support brackets. Discard brackets.



6. Using a  $\frac{3}{4}$  inch socket and  $\frac{3}{4}$  inch wrench, remove 6 screws attaching side condenser mount plates to condenser assembly. Save hardware. Discard plates.



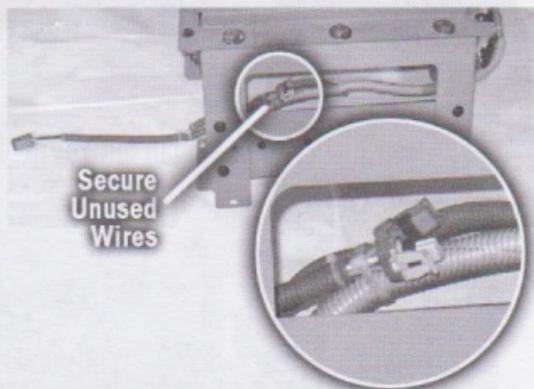
7. Using original hardware, attach 2 new M-1025 hardback condenser mount brackets.



8. Using original screws, attach electrical EMI filter panel to plumbing end condenser mount bracket. Be sure to orient panel with wiring on bottom. This will prevent moisture from seeping into and accumulating in plastic filter cover boxes.



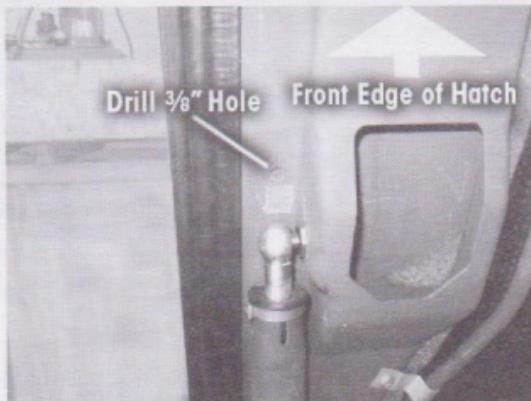
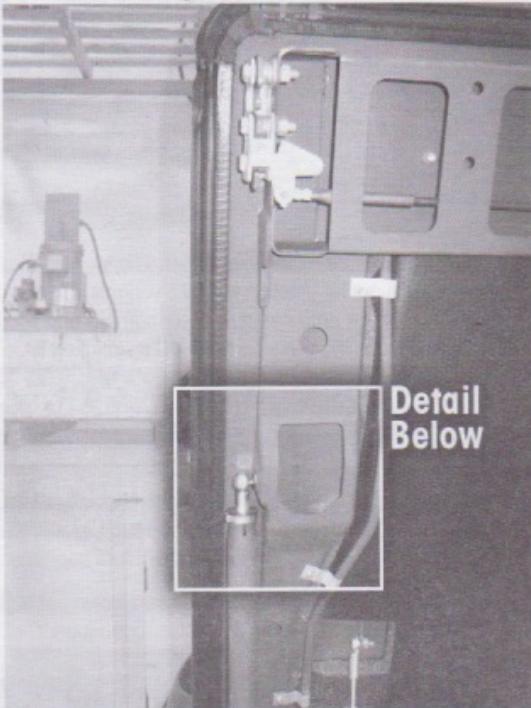
9. Since the pressure switch wires on the condenser wire harness will not be used on M-1025 variants, fold the switch wire back onto the condenser harness and secure with an 8 inch nylon wire tie from A/C installation kit.



10. Condenser assembly is now ready for installation on M-1025.

## 1025 CONDENSER MOUNTING

1. Open hatch and drill one 3/8 inch (.375) diameter hole in outboard flange of stiffener approximately 1 inch forward of gas shock pivot point on each side of hatch. Use existing hole in stiffener flange as a drill locator.



2. Place condenser drill template on outside of hatch. Align with forward edge and holes drilled in previous step. Tape into position. Use a center-punch to mark remaining hole locations indicated on drill template. Drill six more 3/8 inch (.375) diameter mounting bolt holes and three 1 1/4 inch (1.250) diameter hose/wire holes.



3. De-burr holes.
4. Place condenser assembly on rear hatch with wire harness and fittings on driver's side of hatch. Attach condenser assembly to rear hatch with M-8 bolts, washers and nylon lock-nuts.



5. Remove corrugated cardboard from underside of condenser.

2. Using a 10mm socket, remove T2 socket screws from the condenser plate to condenser assembly. Discard the socket.

## AEROQUIP® E-Z CLIP ASSEMBLY INSTRUCTIONS

### Cut the Hose

Cut the hose to proper length with an appropriate cutting tool. Aeroquip's hand-held cutter (79R8920) has been specially designed for cutting all non-wire reinforced hose. Be sure the cut is made square to the hose length.



### Slip Two Clips on the Hose

Slide two clips (be sure to use the correct size) onto the cut end of the hose. The orientation of the clips does not affect the performance of the connection. However, for ease of assembly, both clips should be oriented in the same direction. NOTE: If you don't slide the clips over the hose at this time, you will have to stretch the clips over the hose and fitting later. This may permanently damage the clip.



### Oil the Nipple

Lubricate the nipple with a generous amount of the refrigeration or A/C system's compressor lubricating oil. This MUST be done to lower the force of nipple insertion.



### Insert the Nipple into the Hose

Insert the nipple into the hose. To ensure that the nipple is fully inserted, check the gap between the cut end of the hose and the shoulder of the nipple. Care should be taken to avoid kinking or other damage to the hose during this step. NOTE: Be sure to wipe excess oil from the nipple and hose.



### Snap on the Cage

Snap the cage into the groove on the nipple. The arms of the cage should extend over the hose-covered length of nipple. When the cage has been correctly installed in the cage groove, the cage will be able to rotate in the groove. This step MUST be performed to ensure that:

1. The clips will be located over the O-Rings on the nipple.
2. The connection will be compatible with the connection's pressure rating.



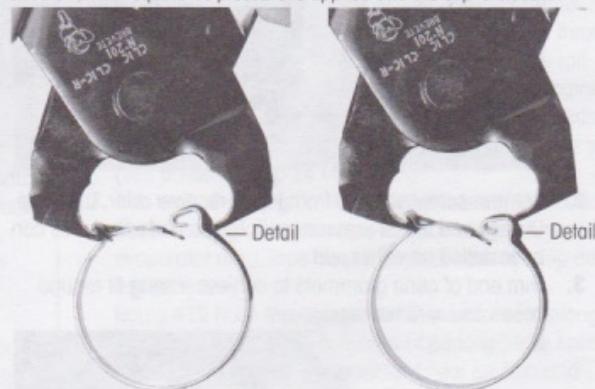
### Position the Clips

Slide the clips over the cage arms and into the channels on each arm of the cage.



### Close the Clips

Using the Connecting Tool (79R8920) to close the clips. The tool should be positioned squarely on the clip connection points and should remain square as pressure is applied and the clip is closed.



CORRECT

INCORRECT

The nose of the plier should be firmly seated under the assembly bump and lock latch. If the pliers are not kept square as you close the clip, the clasp may have an offset. Use the pliers to correct the clasp alignment.



INCORRECT      CORRECT

NOTE: E-Z Clip components should not be reused.

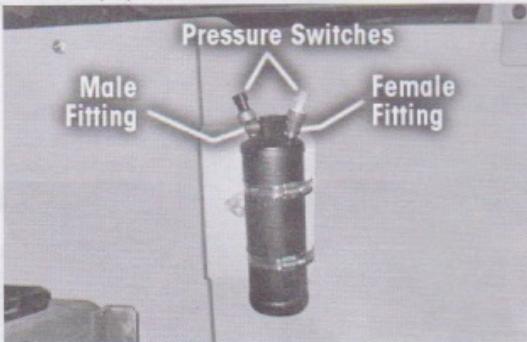
## REFRIGERANT HOSE ROUTING

**Note:** It is imperative that dirt and moisture be kept out of the air conditioning system! Small amounts of debris or moisture can make the system inoperable. Keep all fittings capped until just prior to connecting hoses. Keep ends of hoses covered during routing to avoid contamination.

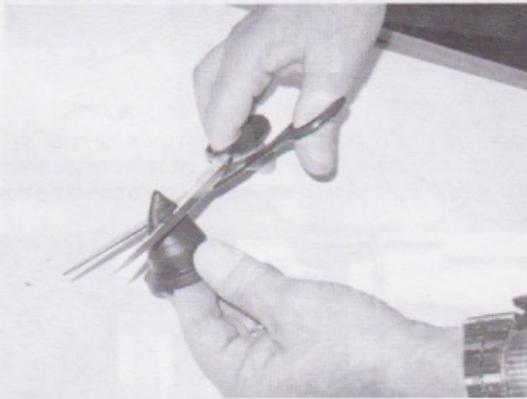
Do not allow hoses to be kinked or come in contact with high heat items such as engine exhaust pipes. Vibration can damage hoses and cause loss of the refrigerant charge. Secure hoses to avoid movement that may cause abrasion and keep hoses away from sharp edges. Use black nylon spiral wrap where needed to protect hoses.

Before connecting fittings check to see that o-rings are present and undamaged. Lubricate o-rings with mineral oil provided just prior to connecting fittings to components or inserting fittings into hoses.

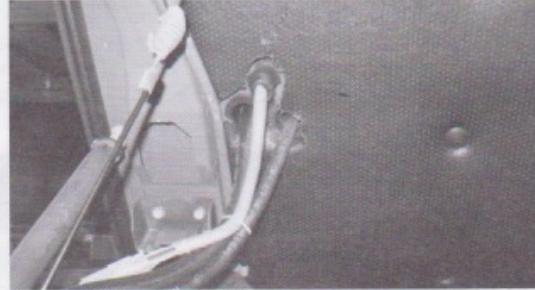
1. Secure receiver drier to receiver drier mount bracket with band clamps provided. Position receiver drier as shown.



2. Remove screw on caps from top of receiver drier. Lubricate O-rings and install pressure switches to ports. Switches can be installed on either port.
3. Trim end of cone grommets to achieve a snug fit around hoses and wire harness.

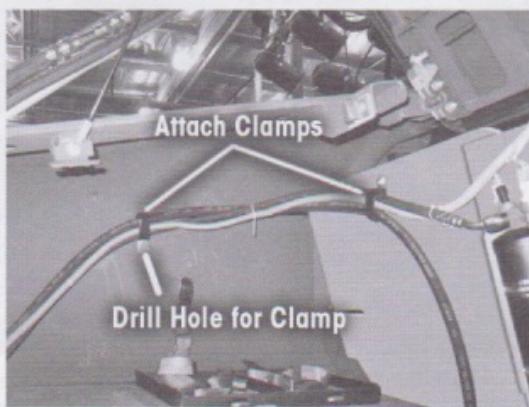


4. Install one grommet in rear most 1 1/4" (1.25) diameter hole from top of hatch. From top of hatch, push six-pin male connector from condenser wire harness through grommet. Pull approximately 8" of wire harness through the hole.

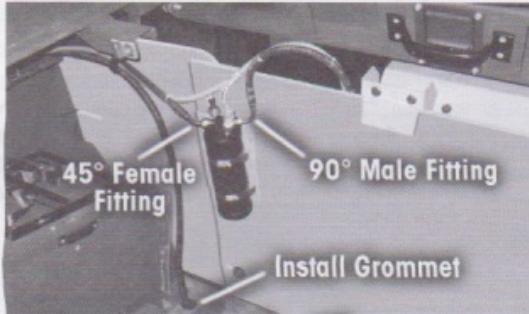


5. Install two grommets in the remaining 1 1/4" (1.25) diameter holes from the under side of the hatch.
6. Tape closed ends of hose to keep debris out of hose. Route #8 hose from underside up through outboard grommet in hatch to condenser fitting. Attach 90 degree female fitting (provided in A/C fitting kit), install a lubricated #8 O-ring on fitting and connect to condenser inlet fitting (larger fitting). See page 7 for fitting crimping instructions.
7. Cut 28" off #6 hose. Set aside for Step 15. Tape closed ends of hose to keep debris out of hose. Route #6 hose from underside up through inboard grommet in hatch to condenser outlet fitting (smaller fitting). Attach 90° female fitting (provided in A/C fitting kit), install a lubricated #6 O-ring on fitting and connect to condenser outlet fitting. See page 7 for fitting crimping instructions.
8. Connect condenser jumper harness to six-pin male connector on condenser harness.
9. Adjust hose lengths from condenser fittings to grommets to create smooth routing with no kinks.
10. Secure #6 hose, #8 hose and jumper wire harness together with four nylon ties, from grommets in hatch to pressure switch connectors.
11. Route #6 hose and jumper wire harness down along gas shock to receiver-drier inlet. Connect wires to pressure switches on receiver drier. Pressure switch wire connectors are different and must be connected to the correct switch. If it doesn't snap on with minimal pressure try the other switch. Continue routing wires over armor to evaporator unit. Connect to mating connector on evaporator unit. Leave a large loop in the hose to allow hatch to be opened either direction. Hose length should match length of

jumper harness to receiver drier. Do not cut to length or connect fittings to receiver drier yet.

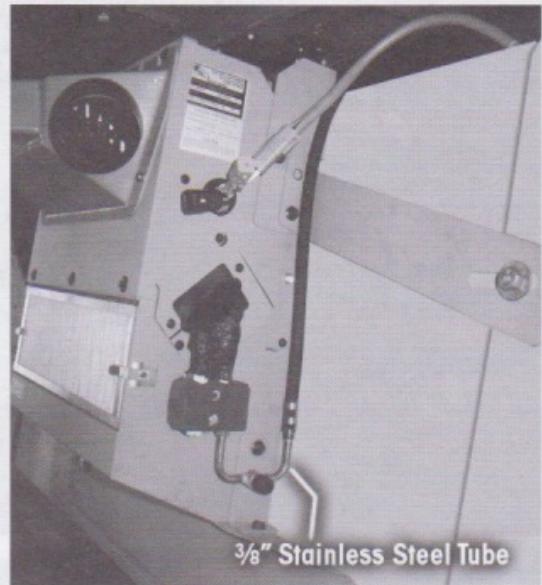


12. Temporarily tape hoses to gas shock. Open and close hatch in both directions to check hose routing for sufficient slack to prevent strain on hoses when hatch opens or closes. Secure hoses and wires together and to gas shock with nylon tie straps.
13. Drill hole in side of cargo cover and secure hoses and wires using P-clamp, M6x20 screw, flat-washer and nylon lock-nut. Secure hoses and wires to back of armor using P-clamp, M6x30 screw, flat-washer and nylon lock-nut.
14. Connect #6 hose to receiver-drier inlet (male port) using #6 45° female fitting (provided in A/C fitting kit).



15. Lubricate O-ring and install  $\frac{3}{8}$ " stainless tube with two 90° bends into expansion valve on evaporator unit (hand tight only). Connect remainder of #6 hose to receiver drier

using 90 degree male fitting (provided in A/C fitting kit). Route hose over armor to stainless steel tube connected to evaporator unit. Trim hose to length and crimp onto stainless tube.

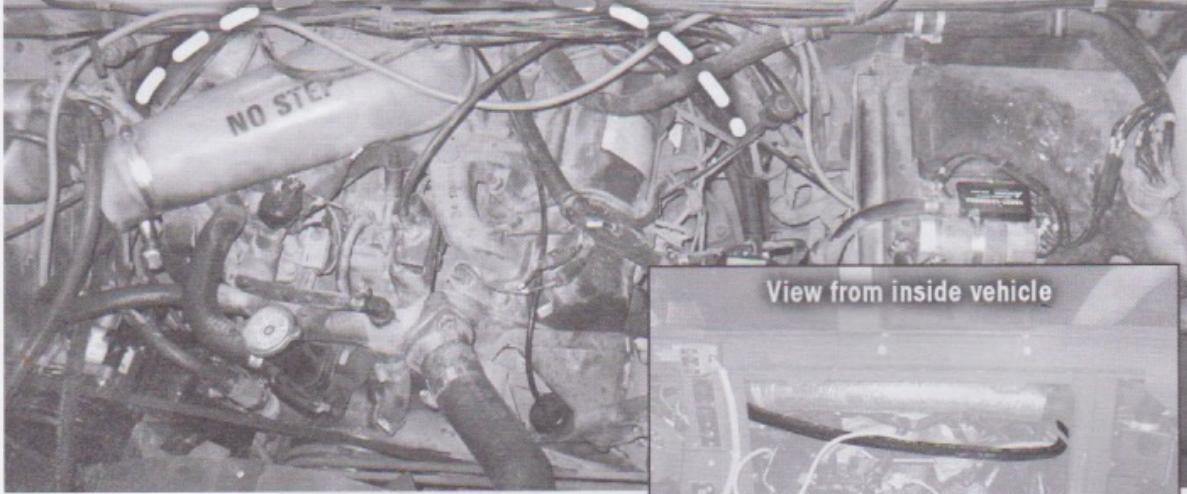


16. From the cargo area of vehicle, install one grommet in  $1\frac{1}{4}$ " (1.25) diameter hole in bed. Route #8 hose through grommet in bed then forward along top of frame rail. Route outboard of parking brake linkage then up into engine compartment near oil filter and dipstick. Allow for extra hose at this end. Do not cut hose or connect fittings yet (see photo for step 14 below left).
17. Trim end off cone grommet to achieve snug fit around #12 hose. Install grommet in hole in transmission tunnel (under evaporator unit). Tape closed ends of hose to keep debris out of hose. Route #12 hose through grommet then forward along frame rail. Route hose outboard of parking brake linkage, then up into engine compartment near oil filter and dipstick. Soapy water will ease routing of hose through grommet. Allow for extra hose at each end. Do not cut hose or connect fittings yet.



*Refer to step #6 below*

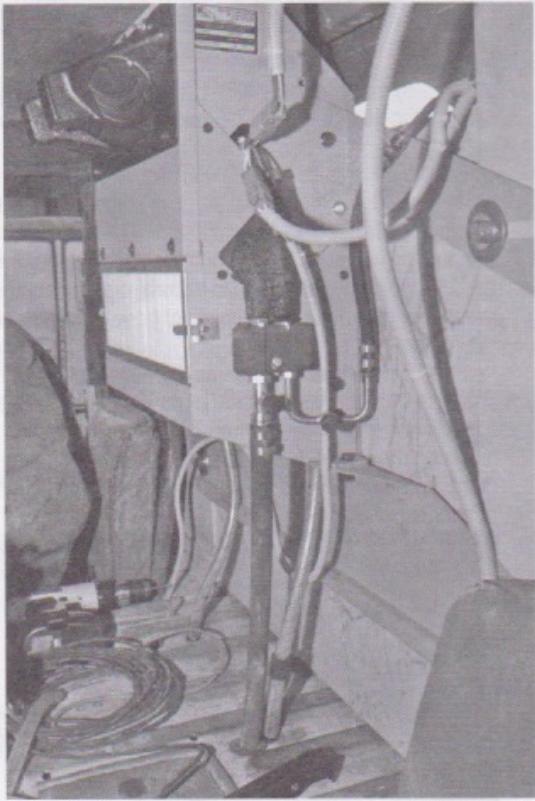
**Follow dotted line to route #8 and #12 hoses.  
Note that it passes beneath the body panel as shown**



**View from inside vehicle**



**Doghouse removed to show hose routing**



- 18.** Route #8 and #12 hoses over engine and behind air intake duct to passenger side of engine then forward to compressor. Remove doghouse cover to ease hose routing over engine.

*Refer to photos at top of page*

- 19.** Using nylon tie straps, secure hoses under vehicle and along firewall. Avoid high heat surfaces, sharp edges and moving parts of vehicle. Keep hoses tucked up high

enough to keep them from being snagged as vehicle drives over obstacles or brush. Hoses should span no more than 2 feet without being secured. Secure hoses to top of frame rail by joining two large nylon ties together and wrapping around hoses and frame rail. Do not over tighten and collapse hoses.

- 20.** After securing hoses, lubricate o-rings and install #10/12 straight male fitting into expansion valve and #10/12 90° female fitting to compressor (hand tight only). Be sure hood of vehicle will close and air intake duct can be re-installed over compressor. Trim ends of #12 hose to length and crimp onto fittings. Lubricate fittings prior to inserting into hose.

*See hose/fitting assembly instruction on page 7...*

- 21.** After securing hoses, lubricate o-rings and install #8 fitting on compressor. Depending on installation requirements connect a 45° or 90° female fitting onto compressor (hand tight only). Be sure hood of vehicle will close and air intake duct can be re-installed over compressor. Trim end of #8 hose to length and crimp onto fitting. Lubricate fitting prior to inserting into hose.

- 22.** Tighten fittings of #8 and #12 hose onto compressor, condenser and expansion valve.

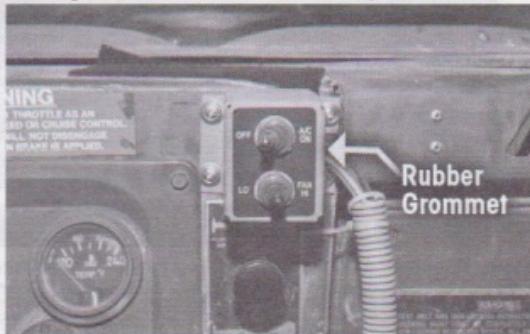
- 23.** Cut drain hoses to reach from bottom of evaporator unit to top of transmission tunnel ( $1\frac{1}{16}$ " diameter holes). Install rubber duck bill fittings onto drain hoses with plastic connector. Attach drain hoses to drain tubes on bottom of evaporator unit. Push duck bill fittings into  $1\frac{1}{16}$ " holes.

- 24.** Reinstall plywood panel on top of transmission tunnel by notching around drain hoses and refrigerant lines.

## ELECTRICAL CONNECTIONS

**Note: Disconnect battery to avoid electrical short circuits or accidental startup.**

1. Remove screws attaching instrument cluster panel to dash board.
2. Attach air conditioner control panel to dash board using four self-drilling sheet metal screws provided in the kit. Make sure rubber grommet is in slot of metal box to protect wires.



3. Route short two-wire extension from control panel wire harness through gap under dash (near heater switch) up into instrument cluster compartment.



4. Locate ignition controlled power wire supplying power to vehicle heater switch. It will be the center wire labeled "27D" on the switch. Remove larger end cap from posi-lock T-splice connector and attach to wire 27D about 4" from heater switch. Remove smaller end cap from posi-lock connector and attach white wire from control panel extension.



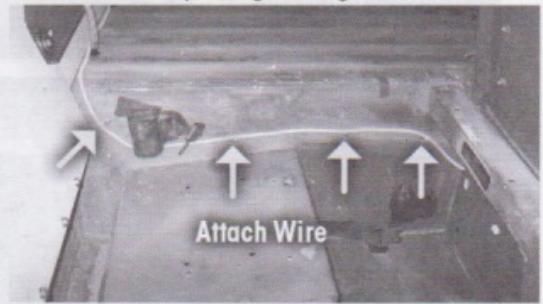
5. Connect black wire with white stripe to compressor. Route compressor wire over the engine along the firewall then

through hole in firewall adjacent to dash panel. Connect to black wire with white stripe from control panel extension using posi-lock end splice connector. Secure wire with nylon tie straps.

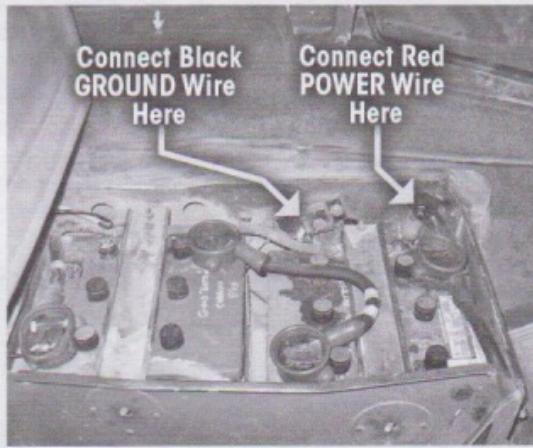
6. Connect condenser harness to evaporator unit harness. Secure wires to refrigerant hose with nylon tie straps.
7. Connect control panel harness to evaporator unit harness. Route wires along edge of transmission tunnel under drivers side mats. Secure harness to #12 refrigerant hose with nylon tie strap near top of transmission tunnel. Cut notch in mat for hose and reinstall screws attaching mat to transmission tunnel. Secure wire where required elsewhere using nylon tie straps.



8. Connect power and ground wire harness to evaporator unit harness. Route across transmission tunnel to passenger side.
  - a. For two passenger configurations, route wires through grommet, directly into battery box.
  - b. For four passenger configurations, route wires forward along transmission tunnel then through grommet into battery box.
  - c. Secure wires along routing using nylon tie straps. If nothing is present to secure wires to, use tie wraps with a ¼" hole and philips washer head, self drilling screws. Be sure nothing will be damaged on opposite side of panel when screws are installed. **Caution: Fuel tank is directly under passenger side of transmission tunnel on four passenger configurations.**



- 9.** Route red wire to  $\frac{1}{2}$ " inch 24VDC positive terminal and black wire to Philips head screw on negative ground shunt. Check voltage at red and black wires.



## AIR DISTRIBUTION DUCTING

**1. For two-door configuration:**

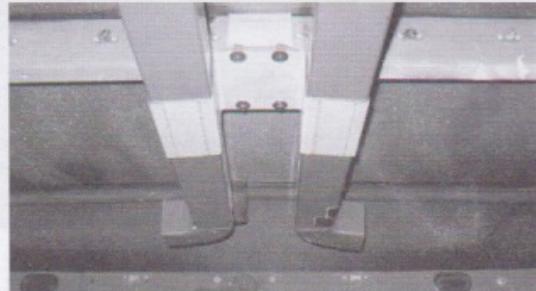
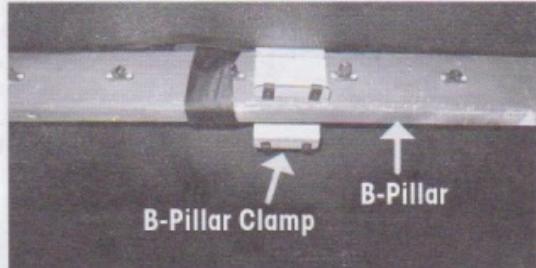
- a. Cut off male end of 90° elbows so that the elbows fit over the square outlets on the plastic plenum. Attach 90° elbows to plenum.



- b. Turn fan on and check air delivery. Adjust as required. When acceptable, apply a generous quantity of PVC cement to the mating surfaces of both parts and secure with philips washer-head screws to permanently attach elbows.

**2. For four-door configuration without ring turret:**

- a. Attach square ducting to plenum. Using support brackets provided, clamp ducting to b-pillar.

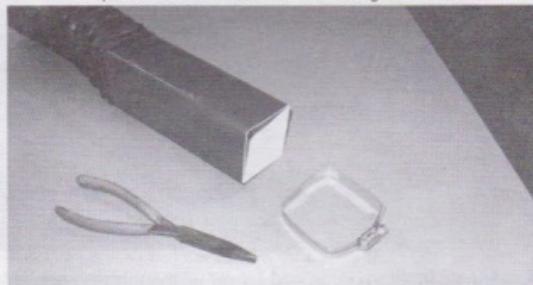


- b. Attach 90° elbows to forward end of ducts to turn air toward driver and front passenger.

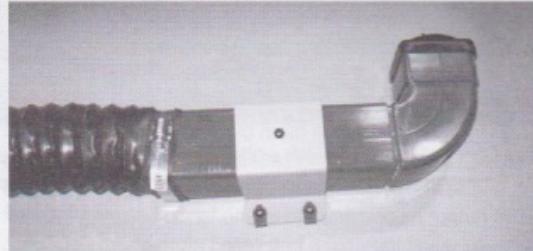
- c. Turn fan on and check air delivery. Adjust as required. When acceptable, apply a generous quantity of PVC cement to the mating surfaces of both parts and secure with philips washer-head screws to permanently attach elbows.

**3. For configurations with ring turret:**

- a. Attach flex-hose to plenum with band clamps provided in kit. Pre-bend band clamps and flex-hose into 2.5 inch square. Do not over-tighten and collapse duct. Route flex-hose outboard around ring turret then forward. Attach with nylon tie straps. Do not over tighten nylon tie straps and constrict air flow through flex hose.

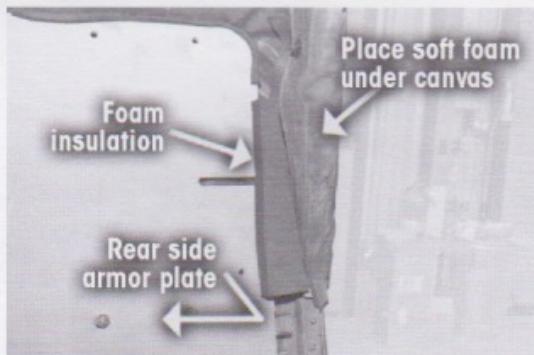
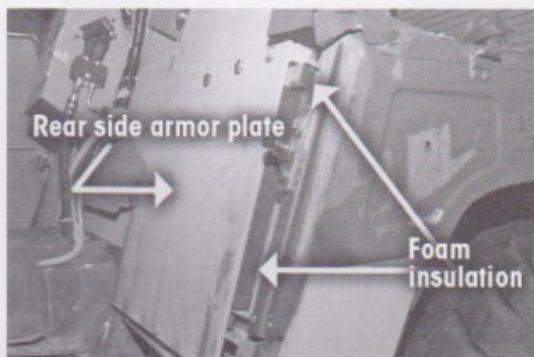
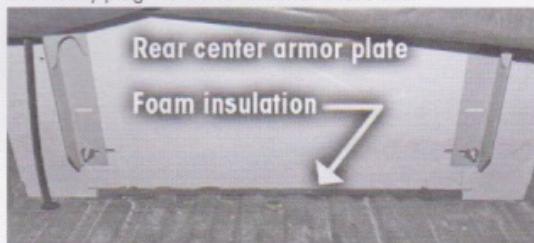


- b. Cut two 8" sections of square ducting. Attach 90° elbows with louvers to one end of each 8" section. Apply a generous quantity of PVC cement to the mating surfaces of both parts and secure with philips washer-head screws to permanently attach elbows. Attach 3" flex hose to end of duct. Use Philips washer-head screws to secure duct to clamps. Turn fan on and check air delivery. Adjust as required. Attach ducts with louvers in desired locations using b-pillar clamps and M5x16 washer head screws.





- Using foam provided in kit and duct tape if available, seal as many cab air leaks as possible. This will keep cool air inside the cab and will help keep dust out that will eventually plug the air conditioner intake filter.



## CHARGING REFRIGERANT SYSTEM

Charging must be done by a certified A/C technician. Charge fittings are inside the cab near the expansion valve on the evaporator unit.

<b>Refrigerant</b>	R-134a	<b>Compressor oil</b>	PAG SP15
<b>Refrigerant charge</b>	4 Lbs 5 oz	<b>Oil charge</b>	270 CC (supplied in compressor) (new system)